C L A I M S

1. A radar device comprising:

a trigger pulse generator which generates a trigger pulse of a predetermined width at a predetermined period;

a transmitter which emits into an intended search space a radar wave having a predetermined frequency pulse-modulated by the trigger pulse from the trigger pulse generator;

a receiver which receives a reflected wave of the radar wave emitted by the transmitter and outputs a receive signal;

a delay unit which delays the trigger pulse from the trigger pulse generator by a predetermined delay time;

a local pulse generator which outputs a local pulse signal having the predetermined frequency pulse-modulated by the trigger pulse delayed by the predetermined delay time by the delay unit;

a correlation value detector which determines a strength correlation value between the receive signal output from the receiver and the local pulse signal output from the local pulse generator;

a delay time changing unit which sequentially changes the predetermined delay time of the delay unit within a range of the predetermined period representing a generation period of the trigger pulse generated by

the trigger pulse generator;

a correlation value storage unit which stores the strength correlation value detected by the correlation value detector for each delay time changed by the delay time changing unit;

a frequency distribution generator which generates a frequency distribution of the strength correlation value stored in the correlation value storage unit with respect to the delay time; and

a search control unit which executes an analyzation for the intended search space based on the frequency distribution generated by the frequency distribution generator.

2. A radar device according to claim 1,

wherein the receiver is configured to change a receiving gain against the reflected wave,

the radar device further comprising a gain changing unit which variably controls the receiving gain of the receiver in accordance with the delay time changed by the delay time changing unit and suppresses a change in an output level of the receive signal due to a difference in the delay time.

3. A radar device according to claim 1,

wherein the correction value detector comprises:

a multiplication circuit which multiplies the receive signal output from the receiver by the local pulse signal output from the local pulse generator, and

an integration circuit which integrates a multiplication output from the multiplication circuit.

4. A radar device according to claim 3, further comprising an analog-to-digital (A/D) converter which converts an integration output from the integration circuit from an analog to a digital signal,

wherein the correlation value storage unit stores the digital signal converted by the A/D converter as the strength correlation value.

5. A radar device according to claim 3,

wherein the integration circuit comprises a Miller integrator.

6. A radar device according to claim 1,

wherein the correlation value detector comprises:

a 90-degree phase shifter which divides the local pulse signal output from the local pulse generator into two signals having 90 degrees of phase difference each other,

a 0-degree distributor which divides the receive signal output from the receiver into two signals in phase with each other,

first and second multiplication circuits which each multiplys the local pulse signal divided into the two signals having 90 degrees of phase difference each other by the 90-degree phase shifter, respectively, with the receive signal divided into the two signals in phase with each other by the 0-degree distributor,

first and second integration circuits which each integrates the multiplication outputs from the first and second multiplication circuits, respectively,

first and second A/D converters which each converts integration outputs from the first and second integration circuits, respectively, from an analog to a digital signal,

first and second square operators which each squares digital signals converted by the first and second A/D converters, respectively, and

an adder which adds square operation results from the first and second square operators and outputs a result of addition as the strength correlation value, and

the correlation value storage unit stores the result of addition output as the strength correlation value from the adder.

7. A radar device according to claim 6,

wherein the correlation value detector further comprises a square rooter which determines a square root of the result of addition from the adder and outputs the square root as the strength correlation value, and

the correlation value storage unit stores the square root output as the strength correlation value from the square rooter.

8. A radar device according to claim 1,

wherein the trigger pulse generator generates a trigger pulse Pt having the predetermined width W of about 1 nsec for about 100 nsec at the predetermined period T and outputs the trigger pulse Pt to the transmitter and the delay unit.

9. A radar device according to claim 8,

wherein the transmitter generates a radar wave of UWB (Ultra Wide Band) of 6 to 7 GHz in the frequency range of 23 to 29 GHz as a radar wave having the predetermined frequency pulse-modulated by the trigger pulse.

10. A radar device according to claim 1,

wherein the receiver comprises:

a variable-gain amplifier which receives and amplifies a reflected wave from an object which is received the radar wave emitted by the transmitter into the intended search space, and

a bandpass filter (BPF) which limits the band of an amplified output from the variable-gain amplifier and outputs as the receive signal to the correlation value detector.

11. A radar device according to claim 1,

wherein the delay unit is configured as a combination of delay means for coarse adjustment capable of changing the predetermined delay time in a large step based on a change instruction of the delay time changing unit and delay means for fine adjustment

capable of changing the delay time finely in the large step.

12. A radar device according to claim 11, wherein the delay means for coarse adjustment changes the predetermined delay time in steps of about 10 nsec, and the delay means for fine adjustment changes the predetermined delay time in steps of about 0.1 nsec.

13. A radar device according to claim 1, used as a short-range radar device for on-vehicle application.

14. A radar device according to claim 1, used as a short-range radar device for blind persons.

15. A radar device according to claim 1, used as a short-range radar device for medical purposes.